

Programmatic Biological Assessment
Stryker Brigade Combat Team

Island of Oahu

**Programmatic Biological Assessment for
Routine Military Training and
Transformation of the 2nd Brigade
25th Infantry Division (Light), U.S. Army**

Oahu, Hawaii

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for

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EXHIBIT 12

Indirect effects are caused by the action and are later in time, but are still reasonably certain to occur. An example of this may be the spread of weeds that affect listed species in areas where a fire had once burned trees.

3.2.1 Direct Effects

3.2.1.1 Helicopter Impacts from Current Military Training

Helicopters are used in current military training on Oahu for aviation training and to transport people, equipment, and supplies for training and land management activities. Potential impacts would include noise (addressed below), helicopter down draft which could knock snails off trees or injure federally listed plants, landing in places with threatened and endangered species, and water drops for fire bucket training.

3.2.1.2 Legacy Construction Projects

Potential affects of Drum Road construction and use are addressed in chapters 6 and 7 (Sections 6.6.3.5 and 7.6.3.5, respectively).

3.2.1.3 SBCT Construction Projects

Construction projects proposed as part of Transformation of the 2nd Brigade have relatively small footprints in lower elevation areas dominated by alien species. No listed species will be directly affected by SBCT construction.

3.2.1.4 Fires from Current Military Training and SBCT Transformation Activities

Though there is little published literature documenting the response of native Hawaiian species to fire, there is voluminous anecdotal evidence to suggest that fire is detrimental to local ecosystems, particularly in the presence of exotic species seed sources. Because these seed sources are present almost everywhere on Oahu, fires that burn through native vegetation allow alien species, particularly grasses and shrubs, to invade and prevent regeneration of native plants (D'Antonio and Vitousek 1992, Freifelder and Vitousek 1998, Hughes and Vitousek 1991). Fire in native vegetation almost invariably damages the ecosystem, in part because every fire burning in native vegetation destroys potential habitat for threatened and endangered species.

3.2.1.5 Alien Species Introductions from Military Sources

Alien plant and animal species, including feral ungulates, small mammals, birds, herpetofauna, and invertebrates have spread and inhabit most of the Hawaiian Islands. They pose a large threat to native island ecosystems because of slow natural evolutionary processes typical of isolated islands, and, because these ecosystems evolved without many of the organisms that have been introduced, they are particularly sensitive to the destructive impacts these species have. Many introductions originated from international ports or were transported from other infested islands. Although Army training activities may not have been the source of introduction and/or spread of these species, Army training and transformation activities can potentially facilitate the spread of existing alien species and result in new introductions to the island of Oahu.

Alien species may be introduced to Army land during military training or transformation, or during proposed changes in military training activities resulting from the transformation (see Section 2.6) via clothing, shoes, equipment, and vehicles. Movements of troops and equipment into Hawaii from other countries, states, or islands, and movements between installations in Hawaii increase the likelihood of introductions into the action areas and the eventual spread into native habitats that support listed species.

species which already occur near the outplanting site. ITAM workers coordinate these decisions with the Army's Natural Resource Section, but the ITAM program still has the potential to introduce alien plant and animal species via this work. Although the overall effect ITAM has on native species and habitats is very beneficial, the potential to introduce alien plants that may negatively impact federally listed species must be assessed.

3.2.3.3 Natural Resource Program

The Army's ecosystem management program has been developed to comply with the Endangered Species Act (ESA). The ESA requires that federal agencies use their authorities to carry out programs for the conservation of federally-listed species and to ensure that their actions are not likely to jeopardize the continued existence of any federally-listed species (Research Corp. of the University of Hawaii 2001). The Natural Resource staff (NRS) manages rare plants and animals and their ecosystems because the Army retains the land and uses it for training. Natural resource workers could potentially introduce weed species via field vehicles or gear during management. Although the overall effect NRS has on native species and habitats is very beneficial, the potential to introduce alien plants that may negatively impact federally listed species must be assessed.

3.2.3.4 Alien Species Introduction by Recreational Use

Alien Plant Introduction. Most alien plant introductions to islands are human induced, but dispersal within and between islands are common via wind, feral ungulates, and birds. Other potential sources for introductions come from civilians (e.g., general public hiking, hunting, practicing cultural/religious customs and vehicles on roads within and adjacent to action area).

Alien Animal Introduction. Open public accesses to the installation, public access on roads outside the installation boundaries, and non-military personnel with daily access to the installation are all potential non-military sources of animal introductions in the action areas. Also, alien animal species may disperse (usually by flying) into new uninhabited areas within the subinstallation or action area, or the smaller species may be blown in by winds.

3.2.4 Indirect Effects

3.2.4.1 Spread of Alien Species by Fire

Fire caused by military training can increase the spread of alien species, particularly alien grasses. Each successive fire that reaches native forest stands decreases the potential habitats for listed species, affects the moisture and canopy of the forest boundary, and increases the number of alien plants in areas of native vegetation. In addition, certain alien plant species are specially adapted to spread following a fire. These species could increase their range as a result of continued incidence of fires. These alien plant species compete with native plants for light, nutrients, and space, and impact many of the endangered species both directly through competition and indirectly through alteration of the habitats these listed species require to survive (Cuddihy and Stone 1990).